

Intelligent Compaction



Definition



WIRTGEN AMERICA



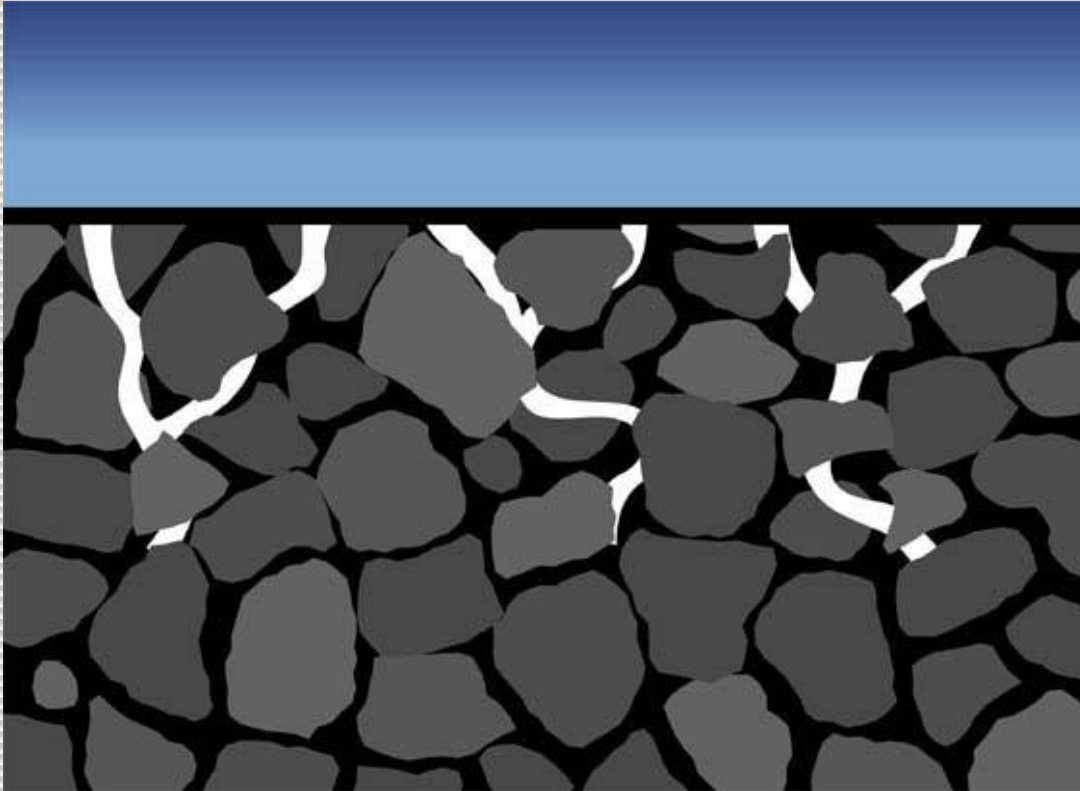
Intelligent Compaction (IC) is an equipment-based technology for better quality control that results in longer pavement lives. IC machines are vibratory rollers that include accelerometers, a global positioning system, infra-red temperature sensors, and on-board computers that can display color-coded maps in real-time to track roller passes, asphalt surface temperatures, and stiffness of compacted Asphalt.



Important Process



WIRTGEN AMERICA



Compaction is one of the most important processes in roadway construction.

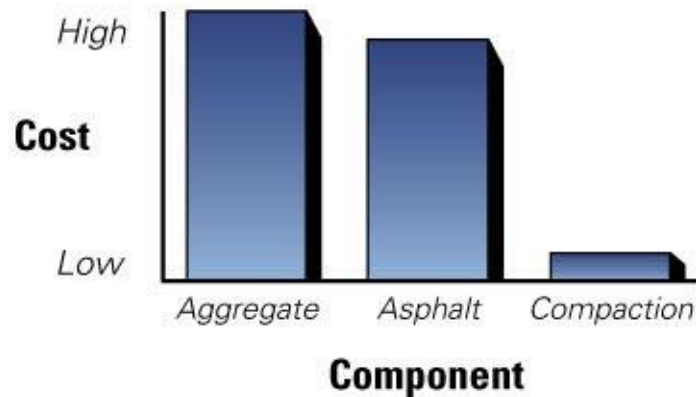


Cost of Compaction



WIRTGEN AMERICA

**Relative cost comparison between
asphalt pavement componets**



- Least expensive part of the paving process
- Aggregates and oil are expensive in comparison
- Compaction adds little to the cost of a ton of asphalt

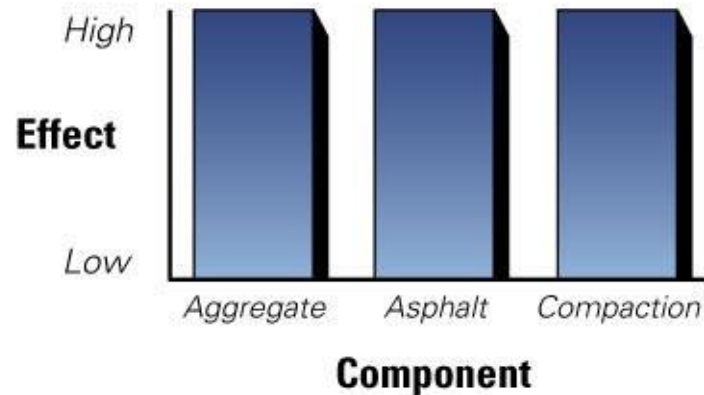


Effects of Compaction



WIRTGEN AMERICA

Relative comparison between each component's contribution to extend pavement life



- **Compaction is equally important in extending pavement life**
- **Saves money in maintenance costs**
- **Understanding compaction is very important**



Characteristics



WIRTGEN AMERICA



Asphalt needs High consistent densities to ensure adequate
support, stability, and strength



Why do we need IC?

Why Intelligent Compaction?



WIRTGEN AMERICA

Shortcomings in the Compaction Process...



**Limited “On The Fly”
Feedback**



**Over or Under-
Compaction Can Occur**



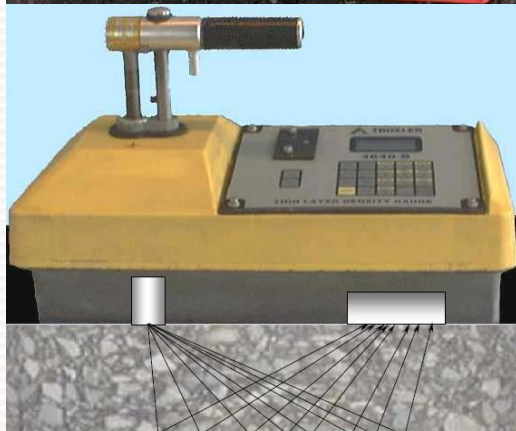
Conventional spot-testing



WIRTGEN AMERICA

non-destructive
spot-testings

Troxler



PQI/PDM



destructive
spot-testings

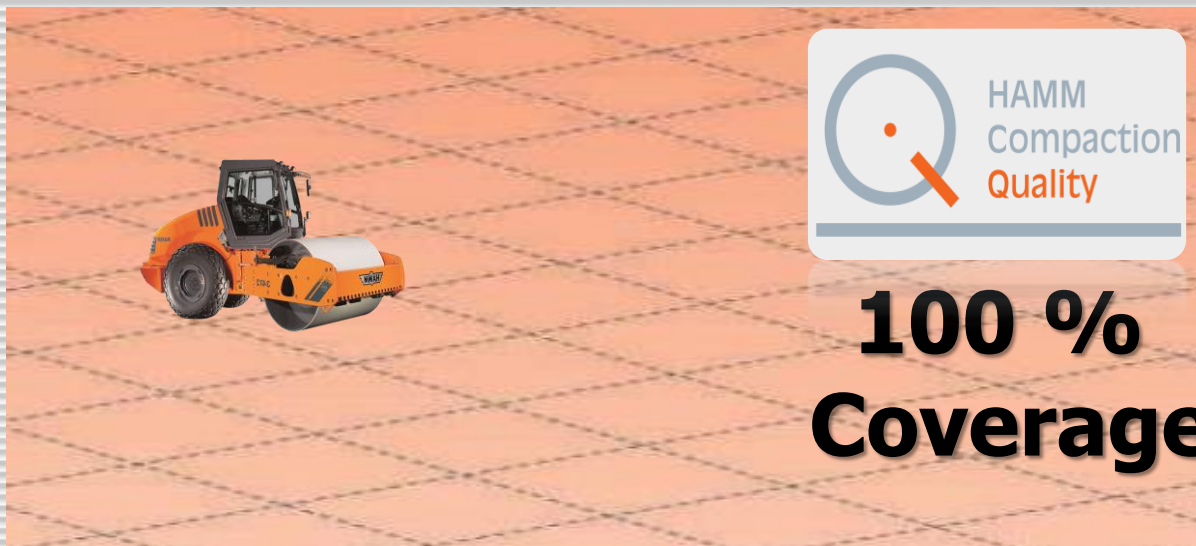
Drill-core



Sampling Coverage



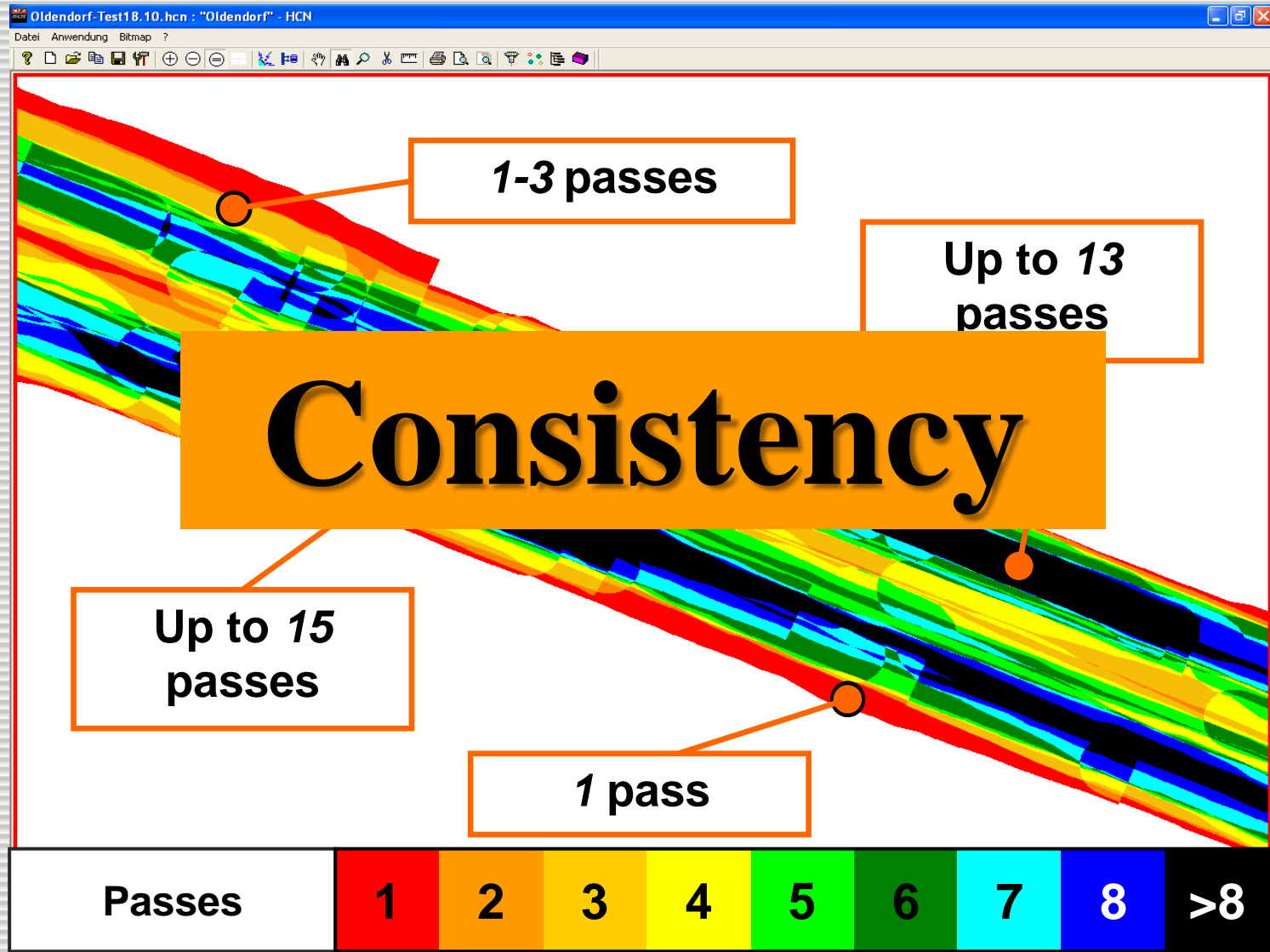
WIRTGEN AMERICA



Practical example: Counting of passes



WIRTGEN AMERICA



Double Drum IC System



WIRTGEN AMERICA



Display



GPS Receiver



Temperature Sensors



Accelerometer



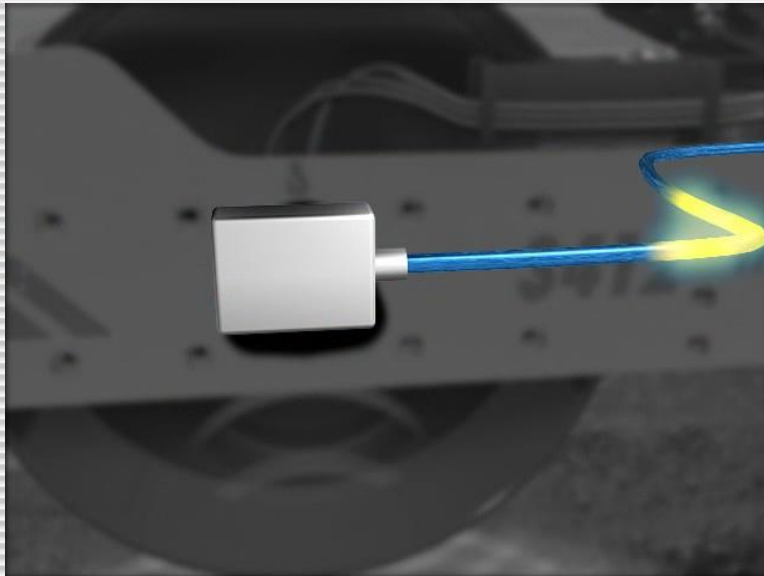
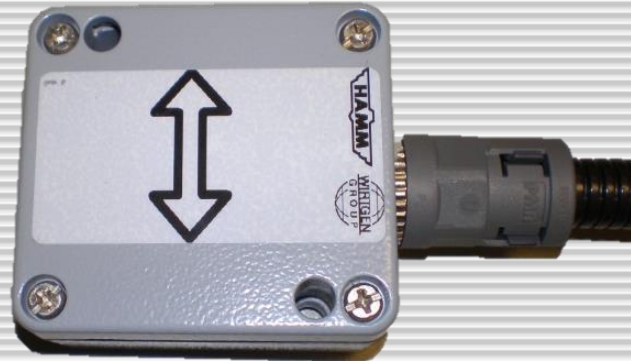
Control Panel



Components: acceleration sensor



WIRTGEN AMERICA

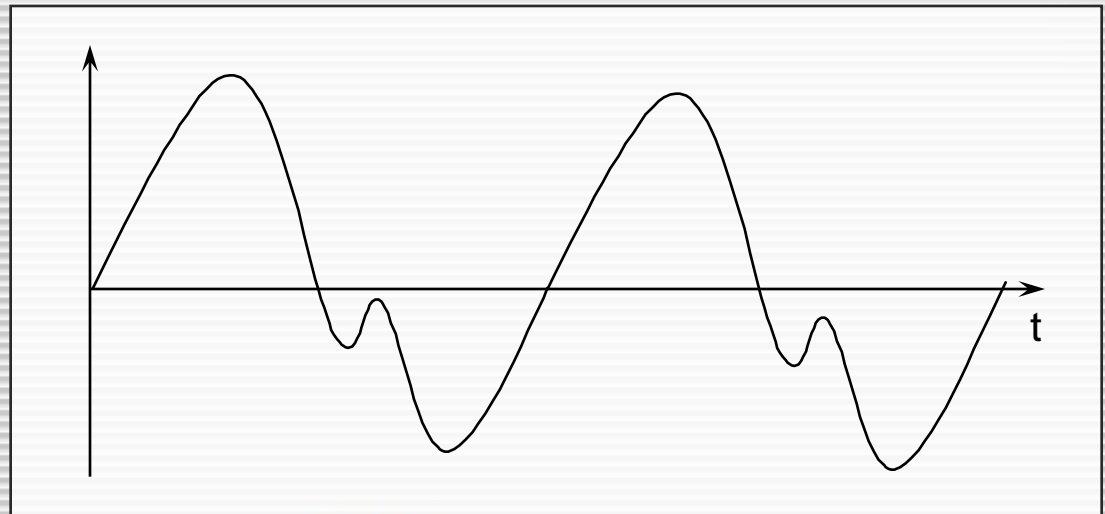
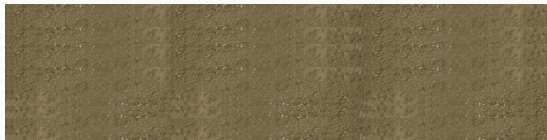
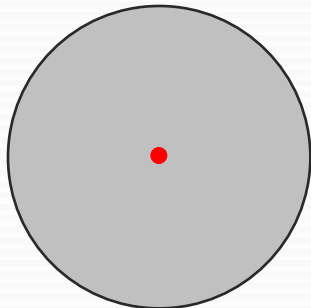
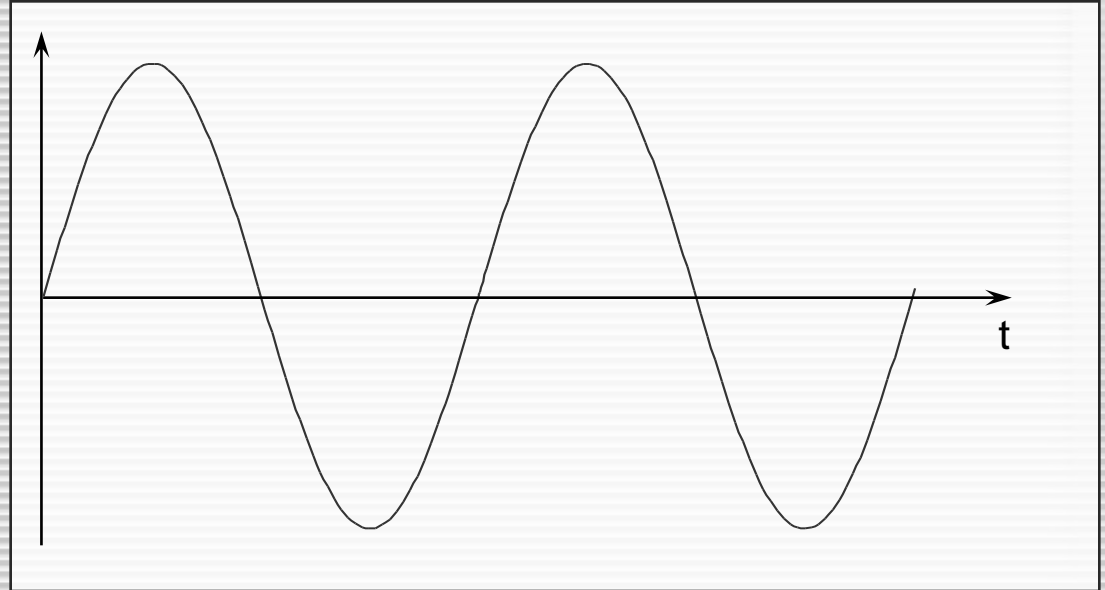
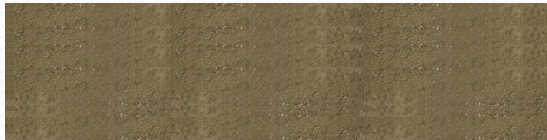
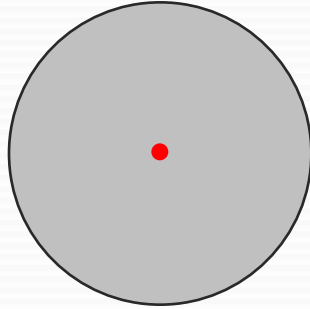


HCQ System



WIRTGEN AMERICA

Acceleration sensor: measurement principle



HCQ System

Components: display unit



WIRTGEN AMERICA



Components: PC Panel



WIRTGEN AMERICA



Panel PC – mounting position



WIRTGEN AMERICA



New position GPS-antenna



WIRTGEN AMERICA



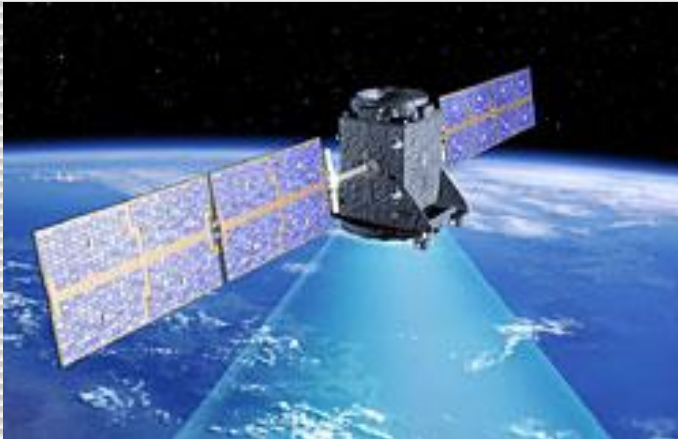
GPS accuracy



WIRTGEN AMERICA



24 satellites on 6 orbits
Intervisibility of min. 4, ideal 8
satellites required



D-GPS accuracy



WIRTGEN AMERICA



Correction calculation of the GPS-signals via geostationary reference stations.

Correction signal is transmitted via communication satellites to D-GPS-receiver (rover).

Accuracy: 2 – 4 in.



RTK (Real Time Kinematik)

– Base station

Accuracy approx. .1 to 3 cm.

Advantages RTK :

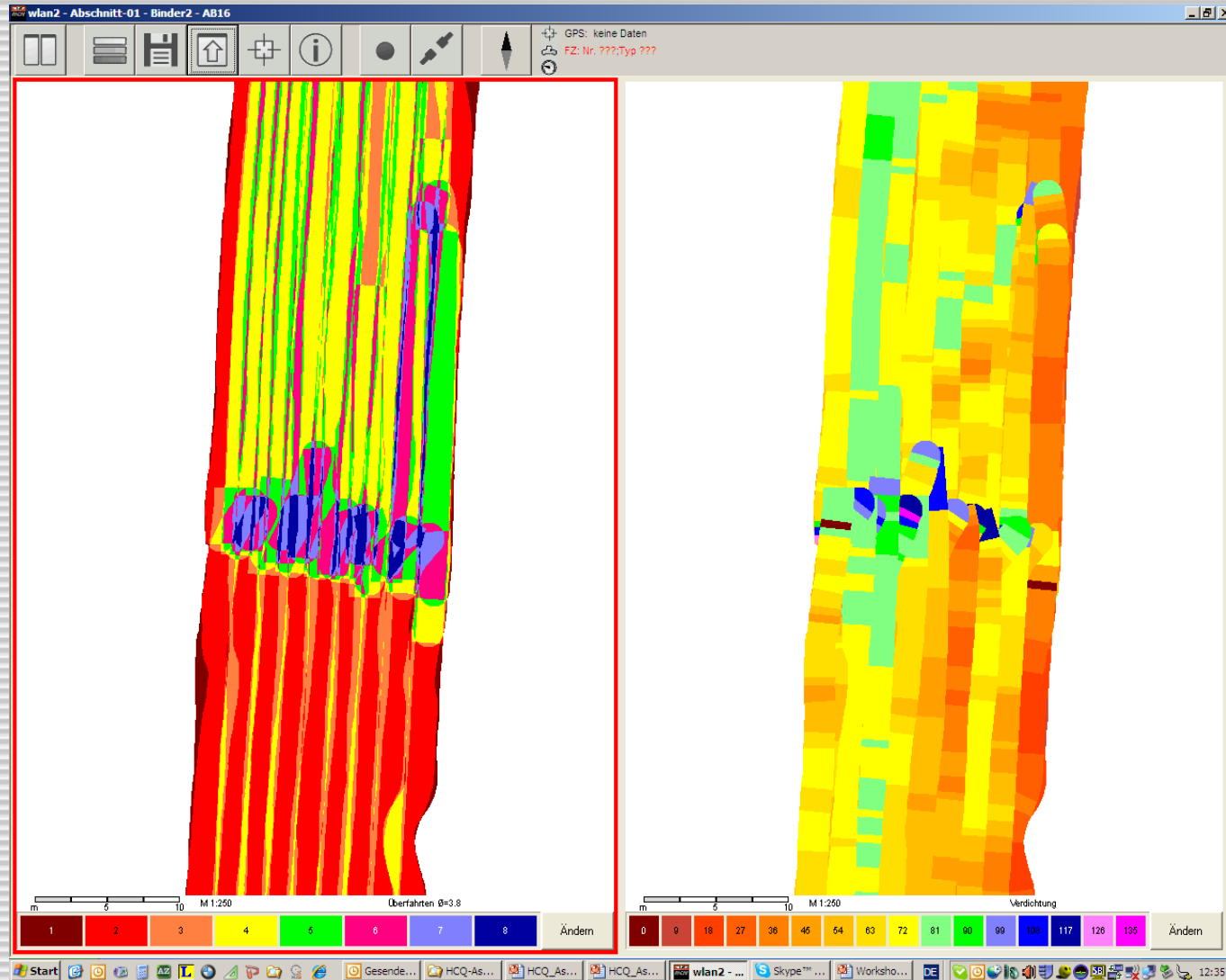
- High accuracy!
- Minor problems by shading
- Operating costs decrease by growing number of machines using the system.



Software – split screen



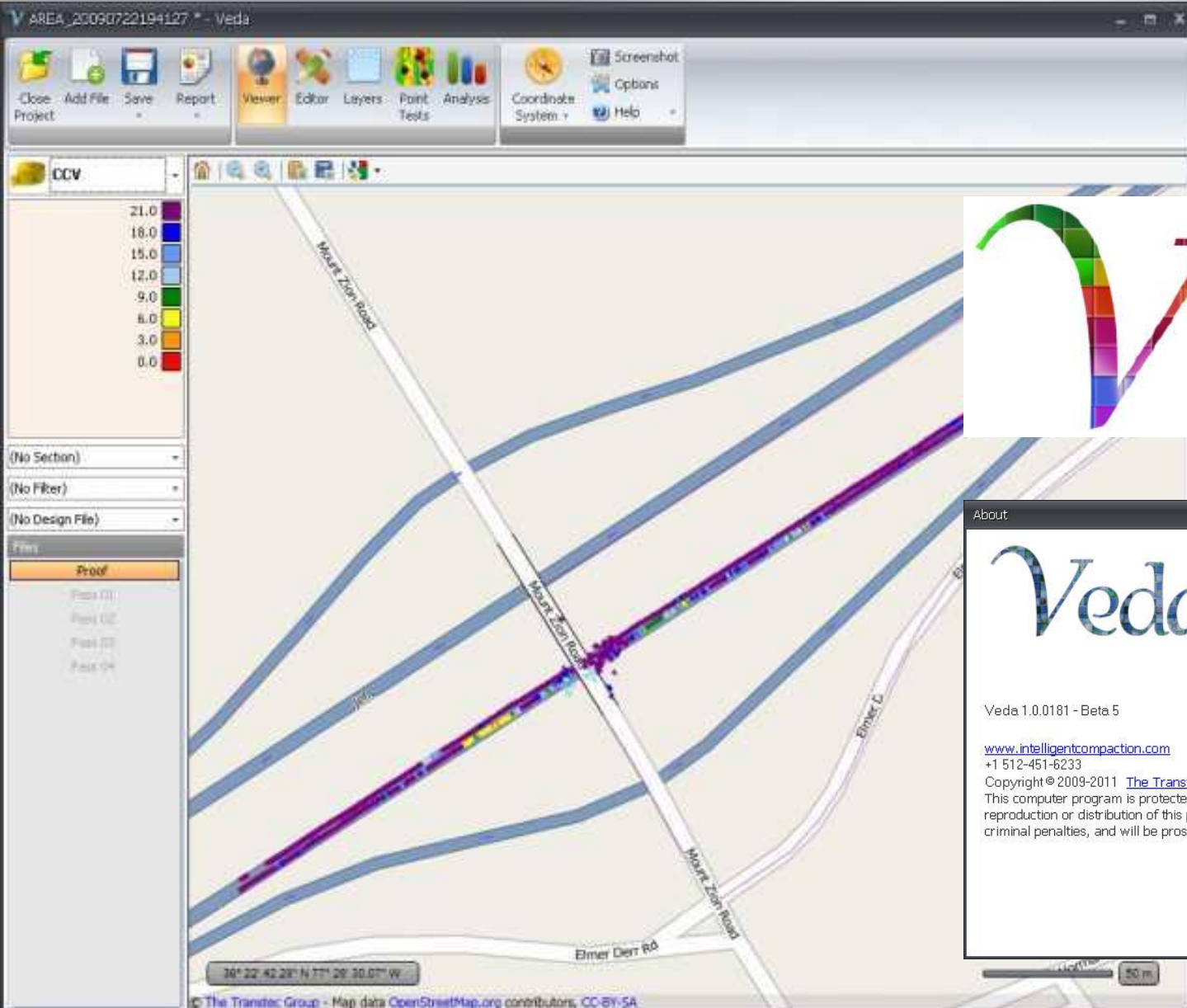
WIRTGEN AMERICA



Data Collection



WIRTGEN AMERICA



Veda

About

Veda  THE TRANSTEC GROUP

Veda 1.0.0181 - Beta 5

www.intelligentcompaction.com
+1 512-451-6233
Copyright © 2009-2011 [The Transtec Group, Inc.](http://www.transtecgroup.com)

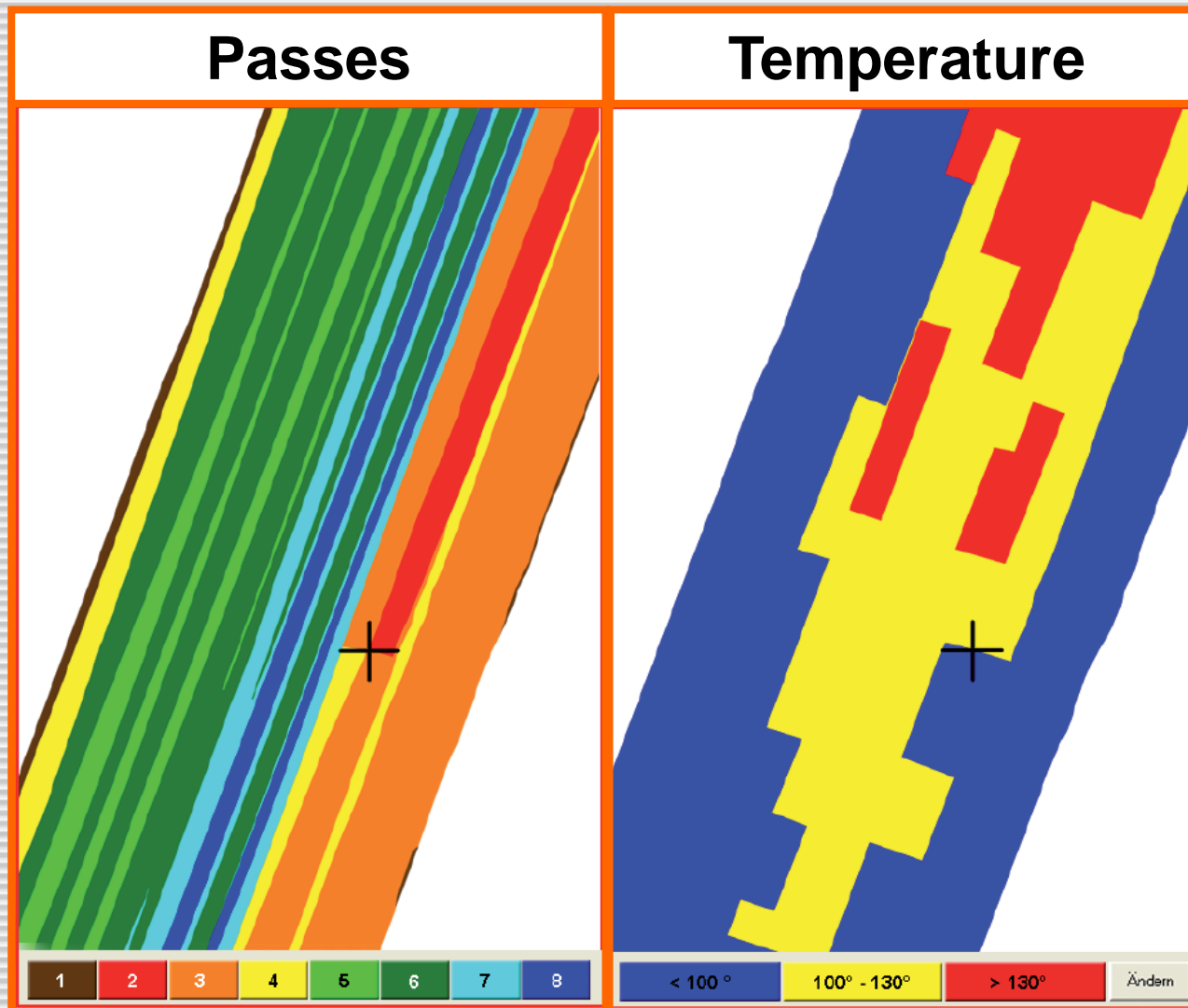
This computer program is protected by copyright law and international treaties. Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under the law.

Multiple rollers – data interchange via radio



WIRTGEN AMERICA



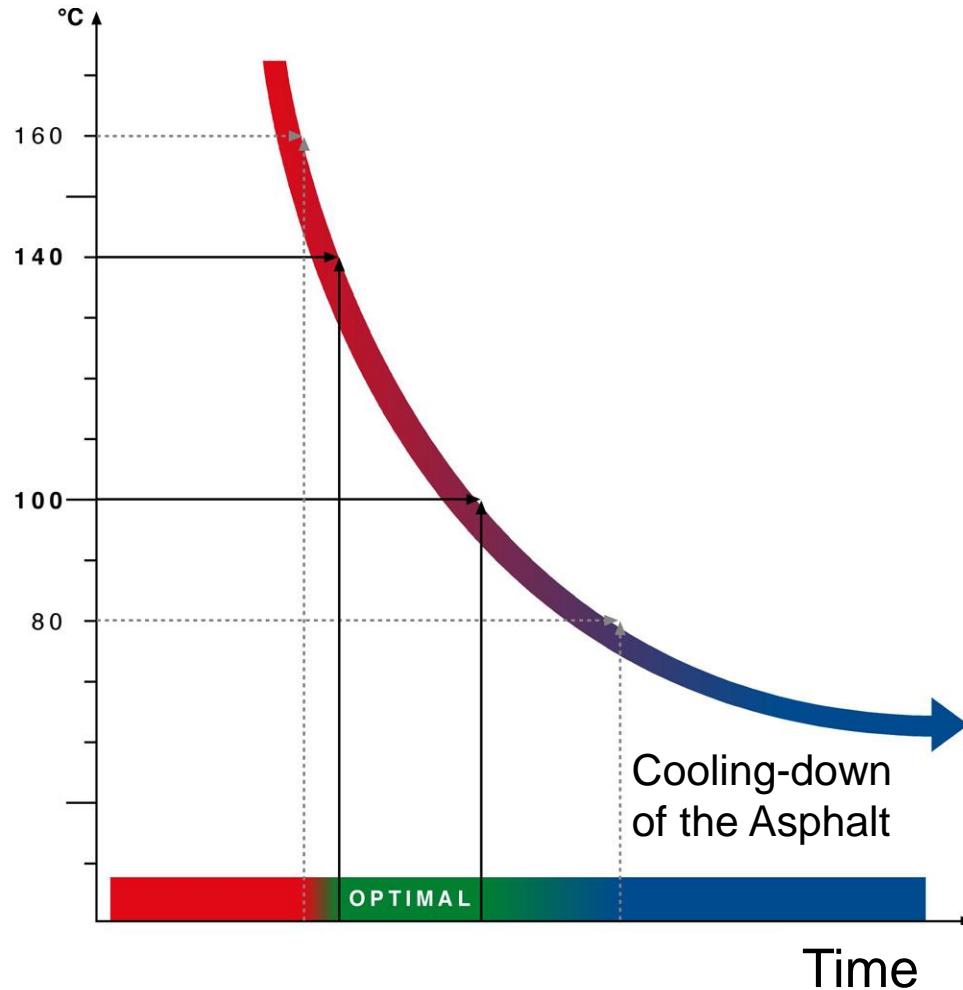


Parameters of the asphalt-compaction



WIRTGEN AMERICA

Cool-down-behaviour

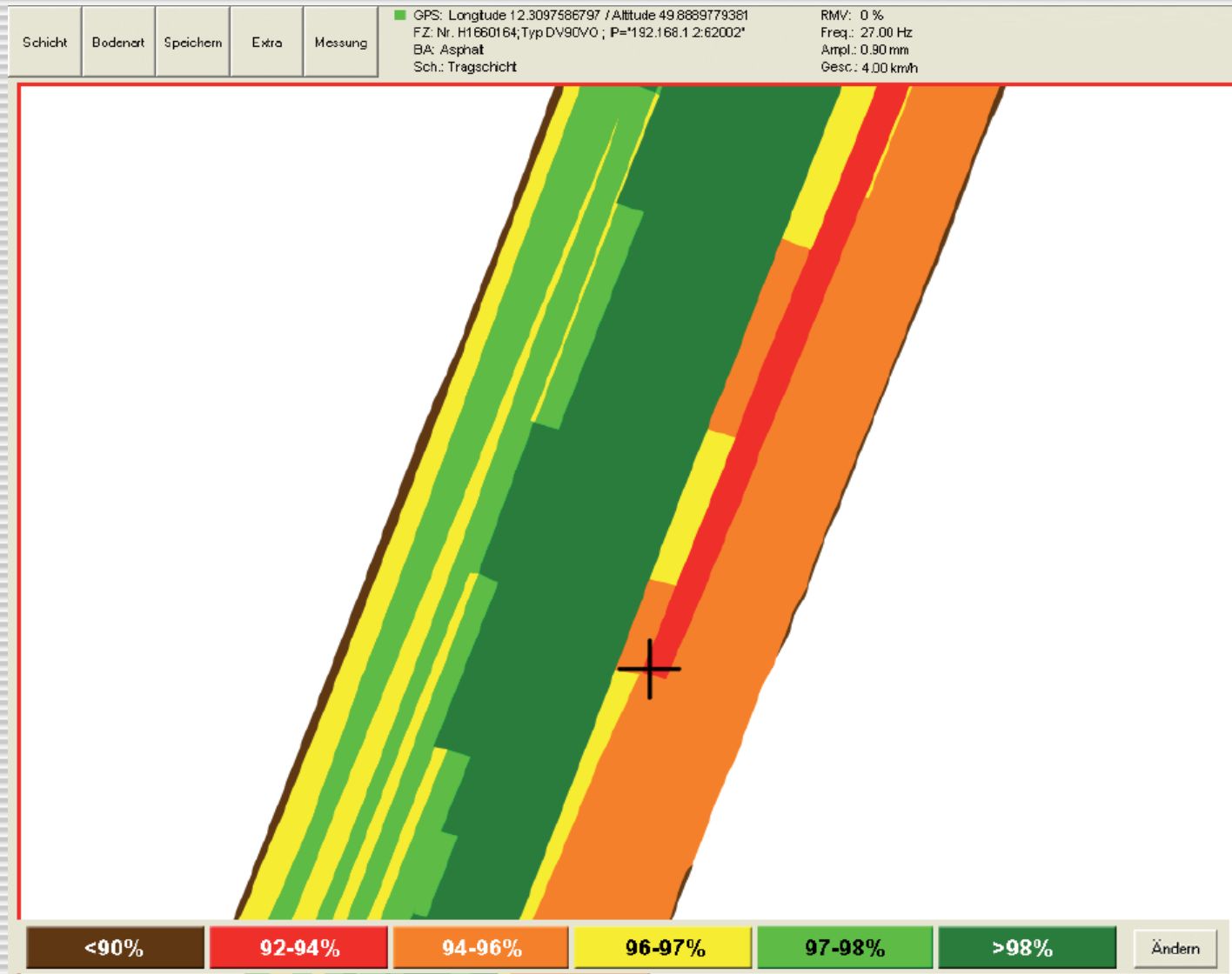




Decision support: Compaction degree



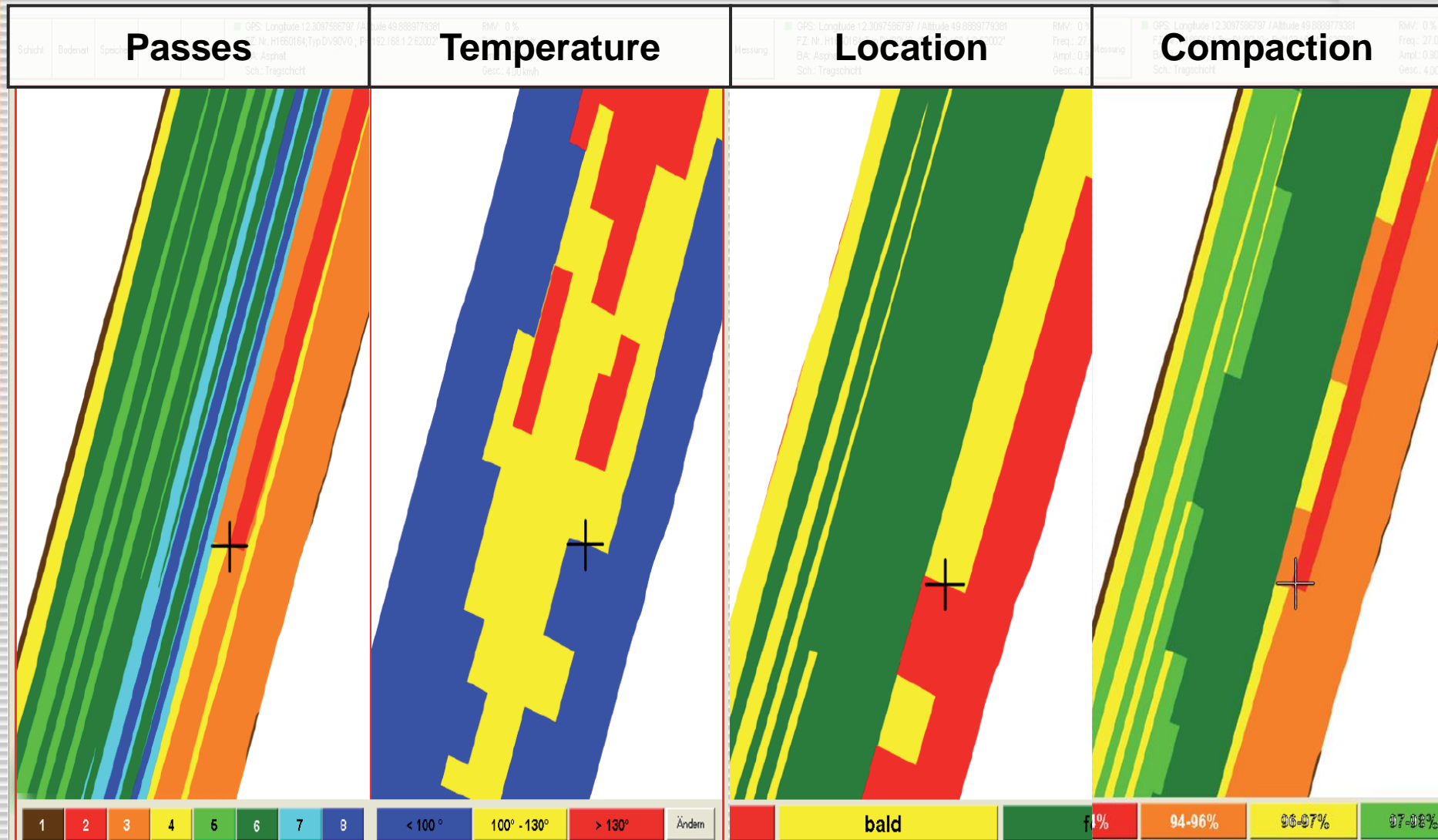
WIRTGEN AMERICA



Decision support: Compaction degree



WIRTGEN AMERICA



IC FHWA Projects



WIRTGEN AMERICA

Field Demonstration Projects



2012 Field Projects

State	Dates	Materials	Rollers	Further Info
Utah	Aug 6 to 9	Asphalt	HAMM and Sakai	Webpage
Florida	Oct 15 to 18	Asphalt	HAMM and Sakai	Webpage



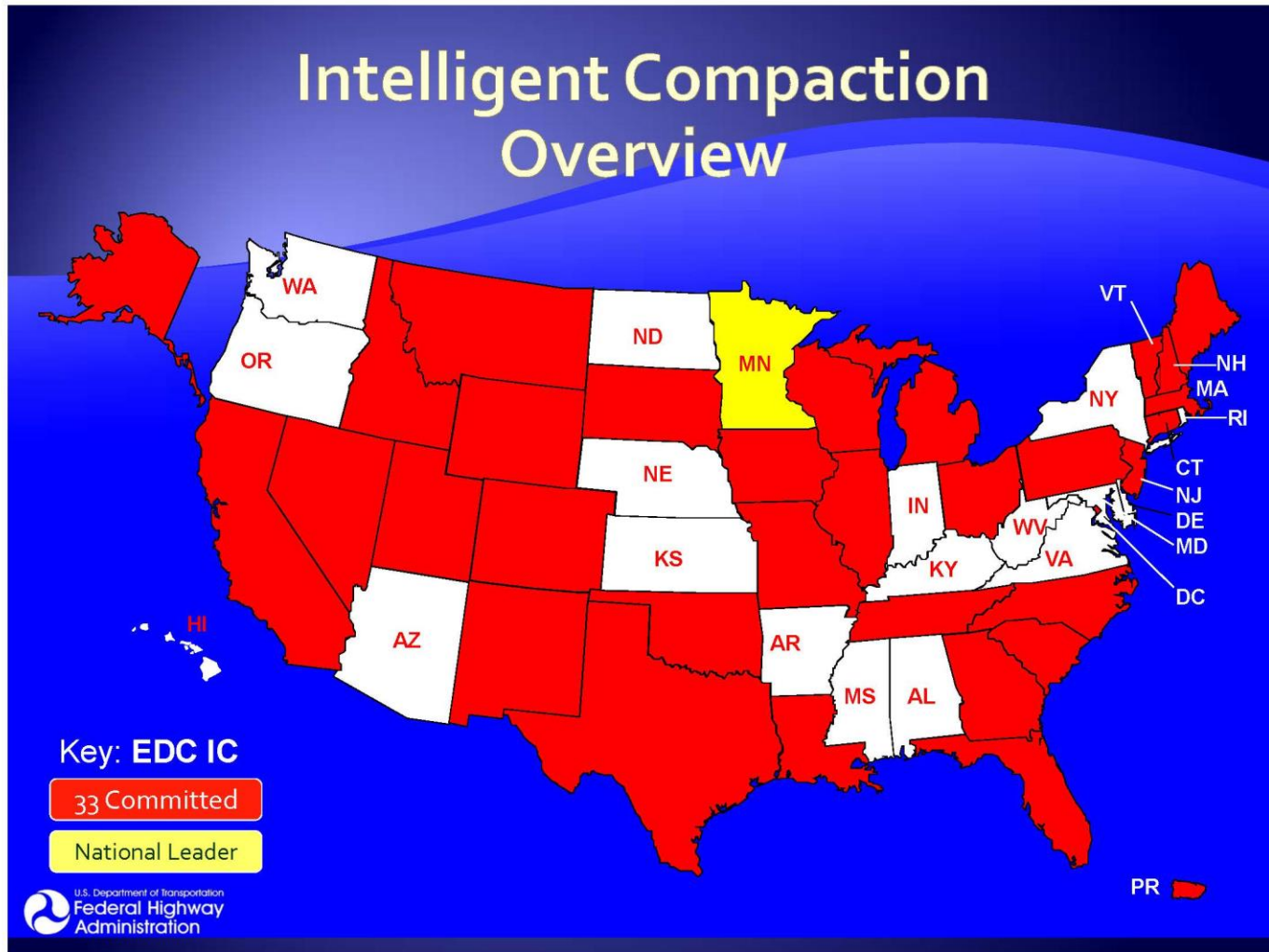
2013 Field Projects

State	Dates	Materials	Rollers	Further Info
Ohio	June 24-27	asphalt	HAMM and Sakai	Webpage
California	Mid-Aug	asphalt	TBA	Webpage
Texas	Aug	asphalt	TBA	Webpage
Maine	Oct	asphalt	TBA	Webpage
EFL-HD	TBA	asphalt	TBA	



2014 Field Projects

State	Dates	Materials	Rollers	Further Info
Maryland	TBA	asphalt	TBA	
North Carolina	TBA	asphalt	TBA	
Kentucky	TBA	asphalt	TBA	
Washington	TBA	asphalt	TBA	





HAMM Compaction Quality

Thank You



WIRTGEN AMERICA

Daulta O'Hanlon

Ontario District Sales Manager
Wirtgen America

